What is claimed is:

1. A wave energy converter comprising:

a support structure fixed to a floor of a body of water;

a piston assembly including a housing that forms a chamber containing an amount of pressurized fluid and having a first end attached to the support structure and a second end, a piston that is slidably disposed within the chamber, and a piston rod that is attached to the piston and that extends from the second end of the housing;

a floatation device that is attached to the piston rod and that is adapted to cause the piston to move upward in the chamber in response to a rising wave, and to move downward by the force of gravity in response to a falling wave, the downward motion and gravitational force being effective to discharge the pressurized fluid from the chamber; and

at least one reservoir that is fluidly coupled to the piston assembly and that receives and stores the pressurized fluid.

2. The wave energy converter of claim 1 further comprising:

a hydraulically driven power generator that is fluidly coupled to the at least one reservoir and that receives and utilizes the pressurized fluid to generate electrical power.

3. The wave energy converter of claim 2 wherein the at least one reservoir comprises:

a high pressure reservoir that is adapted to receive fluid from the piston assembly, and to communicate the fluid to the hydraulically driven power generator at a certain flow rate.

4. The wave energy converter of claim 3 wherein the high pressure reservoir includes an adjustable valve that is adapted to control the certain flow rate.

5. The wave energy converter of claim 3 further comprising:

a low pressure reservoir that is fluidly coupled to the hydraulically driven power generator and to the piston assembly, the low pressure reservoir being adapted to receive fluid from the hydraulically driven power generator.

6. The wave energy converter of claim 5 wherein the piston divides the chamber into a charging chamber and a high pressure chamber, and wherein the piston assembly further comprises a conduit which fluidly couples the charging chamber to the high pressure chamber, thereby allowing fluid to be communicated from the charging chamber to the high pressure chamber as the piston moves upward in the chamber.

7. The wave energy converter of claim 5 wherein the support structure selectively adjustable in length.

8. The wave energy converter of claim 7 further comprising:

a control system that is adapted to monitor water conditions and to control operation of the wave energy converter based upon the monitored water conditions.

9. The wave energy converter of claim 8 wherein the control system is adapted to selectively adjust a length of the support structure based upon the monitored water conditions.

10. The wave energy converter of claim 9 wherein the control system is adapted to control the flow of pressurized fluid through the hydraulically driven power generator based upon water conditions.

11. The wave energy converter of claim 8 wherein the control system is adapted to monitor water conditions by use of at least one sensor that is attached to the support structure.

12. The wave energy converter of claim 11 wherein the at least one sensor comprises a pressure sensor.

13. The wave energy converter of claim 11 wherein the at least one sensor comprises a moisture sensor.

14. The wave energy converter of claim 8 wherein the control system is adapted to monitor wave conditions by use of an antenna/receiver unit that is adapted to receive whether data and provide the received weather data to the control system.

15. The wave energy converter of claim 9 wherein the control system comprises a hydraulic assembly adapted to selectively adjust the length of the support structure.

16. The wave energy converter of claim 15 wherein the support structure comprises first and second telescoping members that are selectively moved relative to one another by use of the hydraulic assembly.

17. The wave energy converter of claim 1 wherein the first end of the piston assembly is pivotally attached to the support structure.

18. The wave energy converter of claim 17 further comprising a damper that is coupled to the piston assembly and to the support structure and that is effective to damp pivoting movement of the piston assembly relative to the support structure.

19. The wave energy converter of claim 1 wherein the floatation device is pivotally attached to the piston rod.

20. The wave energy converter of claim 19 further comprising a damper that is coupled to the piston rod and to the floatation device and that is effective to damp pivoting movement of the floatation device relative to the piston rod.

21. The wave energy converter of claim 1 wherein the support structure includes a generally elliptical foundation having a longitudinal axis positioned substantially parallel to the direction of wave fronts.

22. A wave power generator comprising:

a support structure fixed to a floor of a body of water, the support structure including a pair of telescoping members that are movable relative to each other, effective to adjust a length of the support structure;

a hydraulic assembly that is operatively coupled to the support structure and adapted to cause the telescoping members to move relative to one another, thereby adjusting the length of the support structure;

a hydraulic piston assembly that is attached to the support structure and that contains an amount of pressurized fluid;

a floatation device that is attached to the hydraulic piston assembly and that is adapted to move upward in response to a rising wave and downward under the force of gravity in response to a falling wave, the downward motion being effective to discharge pressurized fluid from the hydraulic piston assembly;

a hydraulically driven power generator that receives the discharged pressurized fluid from the chamber, and utilizes the pressurized fluid to generate electrical power; and

a control system that is communicatively coupled to the hydraulic assembly and that is adapted to monitor water conditions and to cause the hydraulic assembly to dynamically adjust the length of the support structure based on the monitored water conditions.

23. The wave power generator of claim 22 further comprising:

a high pressure reservoir that is fluidly coupled to the piston assembly and to the hydraulically driven power generator, the high pressure reservoir being adapted to receive fluid from the piston assembly, and to communicate the fluid to the hydraulically driven power generator at a certain flow rate.

24. The wave power generator of claim 23 wherein the high pressure reservoir includes an adjustable valve that is communicatively coupled to the control system, wherein the control system is further adapted to communicate signals to the valve, effective to control the flow of pressurized fluid through the hydraulically driven power generator based upon the monitored water conditions.

25. The wave power generator of claim 23 further comprising:

a low pressure reservoir that is fluidly coupled to the hydraulically driven power generator and to the piston assembly, the low pressure reservoir being adapted to receive fluid from the hydraulically driven power generator

26. The wave power generator of claim 25 wherein the piston divides the chamber into a charging chamber and a high pressure chamber, and wherein the piston assembly further comprises a conduit which fluidly couples the charging chamber to the high pressure chamber, thereby allowing fluid to be communicated from the charging chamber to the high pressure chamber as the piston moves upward in the chamber.

27. The wave power generator of claim 22 wherein the control system is adapted to monitor water conditions by use of at least one sensor that is attached to the support structure.

28. The wave power generator of claim 27 wherein the at least one sensor comprises a pressure sensor.

29. The wave power generator of claim 27 wherein the at least one sensor comprises a moisture sensor.

30. The wave power generator of claim 27 wherein the control system is adapted to monitor wave conditions by use of an antenna/receiver unit that is adapted to receive whether data and provide the received weather data to the control system.

31. A method for generating electrical power from waves in a body of water, comprising:

providing a floatation device that is adapted to move upward in response to a rising wave and downward under the force of gravity in response to a falling wave; and

utilizing the downward motion and gravitational force of the floatation device to drive fluid through a hydraulically driven power generator, thereby generating electrical power.

32. The method of claim 31 further comprising:

providing a hydraulic piston assembly containing fluid;

supporting the hydraulic piston assembly at a certain height above a bottom of the body of water; and

attaching the floatation device to the piston assembly, such that the downward motion of the floatation device actuates the piston assembly, thereby driving the fluid through the hydraulically driven power generator.

33. The method of claim 32 further comprising:

monitoring water conditions; and

selectively adjusting the certain height based upon the monitored water conditions.

34. The method of claim 32 further comprising:

monitoring water conditions; and

controlling the flow of fluid through the hydraulically driven power generator based upon the monitored water conditions.